Natural Resources Conservation Service
United States Department of Agriculture
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National Resources Inventory

Resources of Washington Series

THE WASHINGTON CROPLAND WATER EROSION STORY 1982-1997

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Between 1982 and 1997, the Natural Resources Conservation Service (NRCS) completed four National Resource Inventories (NRI) in 1982, 1987, 1992, and 1997. This effort gathered critical information about the use and management of nonfederal lands. This was a very interesting period because of the advent of the 1985 Farm Bill (Food Security Act) which implemented many environmental measures addressing water erosion on cropland in Washington.

Emphasis was given to the Highly Erodible Land Conservation provisions (HELC) and the Conservation Reserve Program (CRP). The HELC provision required that conservation compliance plans be developed by December 31, 1990 on those cropland fields determined to be Highly Erodible Land (HEL). Conservation compliance plans needed to be applied on the ground by January 1, 1995. The CRP paid rental rates to farm operators to retire cropland for 10 years or longer. Retirement refers to the establishment of perennial grasses, wildlife plantings, or tree plantings. In some cases, additional erosion control treatments such as grass waterways or terraces where required.

Both the CRP and HELC provisions offered powerful incentives to farm operators to accomplish erosion reduction. Farm operators received yearly payments to maintain CRP and by adopting an HELC plan they remained eligible for US Department of Agriculture's (USDA) program benefits.

The NRI is scientifically designed and conducted and is based on recognized statistical sampling methods and is an ideal tool to assess the results of the CRP and HELC provisions. The 1982 inventory measured conditions prior to the 1985 Farm Bill, the 1987 inventory measured conditions at the beginning of the implementation period, and the 1992 inventory measured conditions after seven years of Farm Bill activities. Results from the 1997 NRI bracket this entire period.

The NRI is a nationally established tool to evaluate natural resource conditions such as water erosion on cropland. NRI's trending database has the perspective of five years between measurements, which allows a view that smoothes out fluctuations in annual agricultural patterns.

The NRCS generally evaluates soil erosion in relation to the soil tolerance value (T).

Typical soil erosion classes are:

- less than 2 tons/ac/yr (<2 tons/ac/yr)
- 2-5 tons/ac/yr (2-5 tons/ac/yr)
- 5-10 tons/ac/yr (5-10 tons/ac/yr)
- 10 or more tons/ac/yr (>10 tons/ac/yr)

A majority of the cropland soils in Washington generally have a T of 5 tons/ac/yr as the maximum rate of erosion that is acceptable for sustaining agricultural productivity. The remaining cropland soils generally have a T of 2 tons/ac/yr.

Overview of Cropland Enrolled in the Conservation Reserve Program 1982 – 1997

The Conservation Reserve Program (CRP) has become a very successful program with a great deal of acceptance in the dryland wheat producing areas of Washington. The purpose of CRP is to cost-effectively assist land owners and operators in conserving and improving soil, water, and wildlife resources. Highly erodible and other environmentally sensitive acreage normally devoted to the production of agricultural commodities were converted to a long-term resource-conserving cover.

In the fall of 1985 the first CRP application period was announced. The first three application periods focused on accepting cropland acres into a general cropland retirement program. Producers were required to seed native or introduced perennial grasses to meet minimum contract obligations. Beginning with the fourth application period, in 1987, a highly erodible land (HEL) designation became a requirement for eligibility into CRP. An HEL determination is calculated on each cropland field based on the soils, slope, and rainfall zones.

From 1987 up to and including the current application period, CRP contract acceptance has had specific environmental benefit requirements attached to the eligibility process. The accepted contracts target water quality, wildlife habitat, and soil erosion and have promoted positive environmental impacts on larger acreage's. A competitive 'ranking' process was initiated. This process allows producers submitting dollar bid offers to determine the rental payment amount they were willing to accept to enroll their acreage into CRP. The bid is evaluated on a competitive basis where the producers know the maximum bid. Bids selected are those where the greatest environmental benefits are generated for each federal dollar expended.

The table below displays the acres of cropland enrolled in CRP by erosion class for the years 1987, 1992, and 1997. The 1982 column shows erosion rates prior to 1987 for those acres enrolled in 1987. As more acres were accepted into the program and as vegetative cover became established, erosion savings continued to mount. The success of CRP in reducing water erosion has been dramatic. As of 1997, only 9,300 acres enrolled in the CRP needed additional time to establish an adequate vegetation cover or solve a specific water erosion problem. These numbers reflect that 91% of the acres enrolled in CRP are in a stable situation.

CRP has become the most successful program in reducing soil erosion on non-irrigated cropland. Most irrigated cropland can produce economic returns that exceed the CRP rental payments and typically have not been enrolled in the program. This voluntary program has had a very positive impact on increasing wildlife cover and food values in the central and eastern regions of Washington.

Status of the 1997 Acres of Cropland Enrolled in the Conservation Reserve Program by Erosion Class

CLASS	1982	1987	1992	1997
TONS / ACRE / YEAR	(Prior to CRP)			
< 2	256,200	294,500	971,000	968,900
2 – 5	109,800	103,900	33,100	38,600
5 – 10	45,700	45,500	10,900	4,600
> 10	43,600	11,400	900	4,700

Overview of Cropland Subject to the Highly Erodible Land Conservation Provision of the 1985 Food Security Act 1982 – 1997

An Highly Erodible Land (HEL) determination has been made by NRCS on every cropland field in the nation for those owners and operators who choose to participate in USDA program benefits covered under Title IX of the Food Security Act of 1985, as amended by subsequent Farm Bills. HEL fields have an erodibility index (EI) of 8 or more. The EI is the measure selected to determine whether a soil map unit is highly erodible. The EI for water erosion is determined by dividing the potential erodibility for the soil map unit (rainfall and runoff, the susceptibility of the soil to erosion, and the combined effects of slope length and steepness) by the soil loss tolerance (T).

If determined HEL, each field is required to be covered by a conservation compliance plan. The plan outlines a conservation system designed to substantially reduce soil erosion when compared to the level of soil erosion existing prior to the application of conservation measures.

Planning and implementation of the HEL portion of the 1985 Farm Bill has taken time to apply. Agricultural producers needed several crop rotations to experiment with the recommended crop management systems. The more motivated producers chose to experiment with equipment modifications to improve water infiltration and increase crop residue amounts remaining on the soil surface. In other instances, cropping systems were modified which required different equipment such as no-till drills. Low commodity prices during this time frame also slowed the implementation progress.

The table below shows acres of soil savings following implementation of conservation plans as a result of the HELC provisions. The HELC provisions have reduced soil erosion in the > 5 tons/ac/yr category within the period covered by the 1982 – 1997 on 379,400 acres. (There are no CRP acres included in this table.)

Final implementation of the HEL plans was completed by January 1995. The 1997 inventory indicates a slight increase in the implementation of conservation practices and the subsequent soil saving benefits. Conservation planning and implementation on HEL has solved 16% of the water erosion problem on cropland in Washington. The largest shift in soil savings is in the > 10 tons/ac/yr class. The majority of the soil savings reported below are based on results from dry cropland.

The results on irrigated cropland were limited. The implementation of conservation practices on irrigated cropland generally involves implementing changes in irrigation systems, crop rotations and surface residue management. Economic conditions delayed many of the conservation measures in the early 1990's. There are many irrigated crops that are considered 'exempt' from USDA farm programs and do not require an HEL conservation compliance plan.

Status of the 1997 Acres of Cropland Subject to the Highly Erodible Land Conservation Provision by Erosion Rate Class

CLASS	1982	1987	1992	1997
TONS / ACRE / YEAR	(Prior to HELC)			
< 2	3,660,500	3,075,300	3,178,900	3,086,300
2 – 5	1,741,700	1,824,700	1,517,900	1,559,100
5 – 10	1,063,100	870,000	1,159,100	1,290,700
> 10	1,328,000	1,525,400	888,900	720,000